

Appendix F

Initial CHART Assessment for the Hood Canal Summer-run Chum Salmon ESU

CHART Participants

The CHART for this ESU consisted of the following NOAA Fisheries biologists: DeeAnn Kirkpatrick (CHART Leader), Steve Fransen, Tom Hooper, Steve Keller, Mike Parton, and Tim Tynan. Steve Ralph (Environmental Protection Agency) is another Federal biologist who served on this CHART.

The following biologists working for NOAA Fisheries provided valuable expertise to the CHART, but were not part of the deliberations or formal scoring/rating process: Bill Graeber (NOAA Fisheries) and Tom Sibley (NOAA Fisheries). This CHART assessment also benefitted from review and comments by staff from the Point No Point Treaty Council and Washington Department of Fish and Wildlife.

ESU Description

The Hood Canal summer-run chum salmon ESU was listed as a threatened species in 1999 (64 FR 14507, March 25, 1999). The ESU includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries, as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington. Hood Canal summer-run chum are the southernmost occurrence of the summer-run life history for the species. The ESU appears to be uniquely adapted to the local habitat conditions, allowing this life-history to persist in what otherwise would be deemed an inhospitable environment.

Sixteen historical demographically independent populations of Hood Canal summer-run chum have been identified for this ESU: eight extant populations (the Union River, Lilliwaup Creek, Hamma Hamma River, Duckabush River, Dosewallips River, Big/Little Quilcene River, Snow and Salmon creeks, Jimmycomelately Creek populations), and eight extirpated or possibly extirpated populations (the Dungeness River, Big Beef Creek, Anderson Creek, Dewatto Creek, Tahuya River, Skokomish River, Finch Creek, and Chimacum Creek populations) (WDFW and PNPTT 2000).

The Summer Chum Salmon Conservation Initiative (WDFW and PNPTT 2000) provides a comprehensive overview of this ESU and describes the following life history and habitat requirements. Migration to spawning grounds occurs from late August through late October. Adults generally spawn in low gradient, lower mainstem reaches of natal streams, typically in center channel areas due to the low flows encountered in the late

summer and early fall. Eggs incubate in redds for five to six months and fry emerge between January and May. After hatching fry move rapidly downstream to subestuarine habitats. WDFW and PNPTT (2000) noted that successful incubation and rearing depends on a variety of conditions including: 1) the presence of adequate large woody debris to reduce scour of incubating eggs and moderate peak winter flow velocities, 2) the absence of excessive fines within spawning gravel, 3) stable channel configuration, and 4) access to floodplain and off-channel areas.

Subestuary deltas support a diverse array of habitats (tidal channels, mudflats, marshes, and eelgrass meadows) that provide essential rearing and transition environments for this ESU. Juveniles rear in these habitats for days to weeks before entering the ocean, and returning adults stage in subestuaries before ascending natal streams to spawn. Juveniles feed primarily on plankton and epibenthic organisms, while subadults feed on similar items as well as larger prey (including fishes and squid). Most adults mature and spawn as 3- and 4-year old fish (WDFW and PNPTT 2000)).

CHART Area Assessments

The Puget Sound Technical Recovery Team (TRT) has identified 5 “geographic regions of diversity and correlated risk” in Puget Sound that are intended to assist in evaluating ESU-wide recovery scenarios (Ruckelshaus et al. 2002). The regions are based on similarities in hydrographic, biogeographic, geologic, and catastrophic risk characteristics and where groups of populations have evolved in common (Ruckelshaus et al. 2002). The Hood Canal summer-run chum salmon ESU occupies two of these regions – the Strait of Juan de Fuca and Hood Canal. Recovery planning will likely emphasize the need for a geographical distribution of viable populations across the range of such regions in an ESU (Ruckelshaus et al. 2002, McElhany et al. 2003). Therefore, as part of its assessment the CHART considered the conservation value of each HUC5 in the context of the populations within these two geographic regions.

The CHART assessment for this ESU addressed four subbasins containing 12 occupied watersheds. Subbasins were chosen as freshwater critical habitat units because they present a convenient and systematic way to organize the CHART’s watershed assessments for this ESU. The CHART noted several streams for which WDFW’s information on summer chum salmon presence appeared to be inconsistent with their own knowledge of these watersheds, as well as presence described in the Summer Chum Salmon Conservation Initiative (WDFW and PNPTT 2000)). In particular, questions were raised with WDFW (B. McTeague, WDFW, personal communication) about the ESU’s presence in Jorsted, Stavis, Seabeck, Big Anderson, and Mission creeks. Of these,

only presence in Mission Creek was reconciled and removed from occupied status. (WDFW 2003) and the others are still being considered for inclusion/exclusion by WDFW.

Unit 1. Skokomish Subbasin (HUC4# 17110017)

The Skokomish subbasin is located at the southern end of Hood Canal, and most of it is in Mason County, Washington (although small portions of the subbasin – unoccupied by this ESU – also extend into Grays Harbor and Jefferson counties, Washington). The subbasin contains a single watershed (Skokomish River HUC5# - 1711001701) and encompasses approximately 245 mi² and 951 miles of streams. The Skokomish River population is the only historic population documented in this subbasin/watershed (WDFW and PNPTT 2000)). Fish distribution and habitat use data from WDFW identify approximately 13 miles of occupied riverine/estuarine habitat in the subbasin/watershed (WDFW and PNPTT 2000)). The CHART concluded that all of these occupied areas contained one or more PCEs for this ESU and identified management activities that may affect the PCEs. The CHART noted that this watershed contains the largest intact estuary in Hood Canal. Table F1 summarizes the total number of occupied riverine and estuarine reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watershed(s). Map F1 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

Unit 2. Hood Canal Subbasin (HUC4# 17110018)

The Hood Canal subbasin includes most of the drainages of Hood Canal proper, including those of the western Kitsap Peninsula. The subbasin includes portions of the following Washington counties: Clallam, Jefferson, Kitsap, and Mason. The subbasin contains 7 of the 12 watersheds occupied by this ESU and encompasses approximately 715 mi² and 3,041 miles of streams. WDFW and PNPTT (2000) identified the following historic populations in this subbasin: Lilliwaup Creek, Hamma Hamma River, Duckabush River, Dosewallips River, Big/Little Quilcene River, Big Beef Creek, Anderson Creek, Dewatto Creek, Tahuya River, and Finch Creek. Fish distribution and habitat use data from WDFW identify approximately 50 miles of occupied riverine/estuarine habitat in the watersheds (WDFW 2003). Occupied reaches in two HUC5s (Dosewallips River and Duckabush River) overlap with FEMAT key watersheds for at-risk anadromous salmonids (FEMAT 1994). The CHART concluded that all of these occupied areas contained one or more PCEs for this ESU and identified management activities that may affect the PCEs. Table F1 summarizes the total number of occupied riverine and estuarine reaches identified for each HUC5 watershed as

containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watershed(s). Map F2 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

The CHART identified two streams (Finch Creek and Anderson Creek) and portions of Chimacum Creek that are unoccupied but essential for the conservation of the ESU. These streams historically supported independent populations of summer-run chum salmon (WDFW and PNPTT 2000) and are considered important areas for ESU expansion during recovery (NOAA 2004). The CHART believed that these areas are essential for conservation because they historically supported summer-run chum populations, are still accessible to summer-run chum, are adjacent to other occupied streams that may facilitate recolonization, and - due to the limited number of areas occupied by this ESU - contain habitat that is likely to be important for conservation as the ESU expands (in number of spawners and range) during recovery. The CHART recognized that WDFW and PNPTT did not rate these high due to limited habitat availability and production potential.

Unit 3. Puget Sound Subbasin (HUC4# 17110019)

The Kitsap subbasin includes drainages at the northern entrance to Hood Canal. The portion of the subbasin inhabited by this ESU is wholly within Jefferson County, Washington. The subbasin contains a single occupied watershed (Port Ludlow/Chimacum Creek HUC5# - 1711001908) that encompasses approximately 82 mi² and 212 miles of streams. The Chimacum Creek population is the only historic population documented in this subbasin/watershed (WDFW and PNPTT 2000). Fish distribution and habitat use data from WDFW identify slightly more than 1 mile of occupied riverine/estuarine habitat in the watershed (WDFW 2003). The CHART concluded that all of these occupied areas contained one or more PCEs for this ESU and identified management activities that may affect the PCEs. Table F1 summarizes the total number of occupied riverine and estuarine reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watershed(s). Map F3 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

The CHART also concluded that PCEs in this subbasin warrant a high rating for conservation value to the ESU (NOAA 2004). The CHART identified an additional 5-mile stream segment in Chimacum Creek that is currently unoccupied but essential for the conservation of the ESU. This stream segment historically supported the Chimacum Creek population of summer-run chum salmon (WDFW and PNPTT 2000) and, due to

the limited number of areas occupied by this ESU, is likely to be an important area for ESU expansion during recovery (NOAA 2004).

Unit 4. Dungeness-Elwha Subbasin (HUC4# 17110020)

The Dungeness/Elwha subbasin includes drainages to the eastern Strait of Juan de Fuca and includes portions of Clallam and Jefferson counties, Washington. The subbasin contains three occupied watersheds and encompasses approximately 350 mi² and 1,233 miles of streams. WDFW and PNPTT 2000) identified the following historic populations in this subbasin: Dungeness River, Jimmycomelately Creek, and Snow/Salmon creeks. Fish distribution and habitat use data from WDFW identify approximately 19 miles of occupied riverine/estuarine habitat in the watersheds (WDFW 2003). The CHART concluded that all of these occupied areas contained one or more PCEs for this ESU and identified management activities that may affect the PCEs. Table F1 summarizes the total number of occupied riverine and estuarine reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watershed(s). Map F4 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

CHART Initial Conservation Value Rating

Freshwater Areas

After reviewing the best available scientific data regarding critical habitat for this ESU, the CHART concluded that all of the 12 occupied HUC 5 watersheds were either of high or medium conservation value to the ESU. None of the watersheds was considered to be of low conservation value, primarily because approximately half of the historical populations in this ESU have been extirpated, and the remaining populations occupy a very limited number of stream miles (approximately 60 miles total). The CHART also concluded that all of the occupied areas supported populations necessary to the conservation of the ESU. Table F2 summarizes the CHART's PCE/watershed scores and initial conservation value ratings, and Figure F1 shows the overall distribution of ratings by HUC5 watershed. The CHART concluded that it was important to have high value watersheds identified in each of the two TRT geographic regions (Hood Canal and Strait of Juan de Fuca) and their initial assessment reflects that conclusion. The CHART benefited from the considerable information contained in the Summer Chum Salmon Conservation Initiative (WDFW and PNPTT 2000) and that document's emphasis on particular stocks/areas for conservation. Some of these emphases are noted in Table F2 as they related to CHART assessments of conservation value for each HUC5.

Marine Areas

In addition to the freshwater and estuarine areas described above, the CHART also evaluated five nearshore marine areas for this ESU (see Map F5). The nearshore marine area considered by the Team includes that zone from extreme high water out to a depth of 30 m and adjacent to watersheds occupied by the ESU. The Team assessment focused on this area because it generally encompasses photic zone habitats supporting plant cover (e.g., eelgrass and kelp) important for rearing, migrating, and maturing chum salmon and their prey. Also, PCEs that may require special management considerations or protection are more readily identified in this zone (e.g., destruction of vegetative cover due to docks and bulkheads). Deeper waters are occupied by subadult and maturing fish, but it is unclear if these areas contain PCEs that require special management considerations or protection. The Team concluded that all nearshore habitat areas from the southern terminus of Hood Canal northeast to Dungeness Bay in the Strait of Juan de Fuca warrant a high conservation value to the ESU. These habitat areas are found along approximately 402 miles of shoreline within the range of this ESU.

References and Sources of Information

References cited above as well as key reports and data sets reviewed by the CHART include the following:

- Correa, G. 2002. Salmon and Steelhead Habitat Limiting Factors; Water Resource Inventory Area 17; Quilcene-Snow Basin. Final Report to the Washington State Conservation Commission.
- Correa, G. 2003. Salmon and Steelhead Habitat Limiting Factors; Water Resource Inventory Area 16; Dosewallips-Skokomish Basin. Final Report to the Washington State Conservation Commission.
- FEMAT. 1994. Record of Decision for amendments to Forest Service and Bureau of Land Management documents within the range of the northern spotted owl. April 1994. U.S. Government Printing Office for the U.S. Department of Agriculture, Forest Service and Bureau of Land Management.
- Haring, Donald. 2000. Salmonid Habitat Limiting Factors. Water Resource Inventory Area 15 (East). Final Report to the Washington State Conservation Commission.
- Kuttel, M. Jr. 2003. Salmonid Habitat Limiting Factors Water Resource Inventory Areas 15 (West), Kitsap Basin and 14 (North), Kennedy-Goldsborough Basin. Final Report to the Washington State Conservation Commission.

- McElhany, P., T. Backman, C. Busack, S. Heppell, S. Kolmes, A. Maule, J. Myers, D. Rawding, D. Shively, A. Steel, and C. Steward. 2003. Interim report on viability criteria for Willamette and Lower Columbia basin Pacific salmonids. Report from the Willamette/Lower Columbia Technical Recovery Team. NMFS-NWFSC. March 2003.
- NOAA Fisheries. 2003. Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead. Report of the West Coast Salmon Biological Review Team dated February 19, 2003.
- Ruckelshaus, M., K. Currens, R. Fuerstenberg, W. Graeber, K. Rawson, N. Sands, J. Scott. 2002. Planning Ranges and Preliminary Guidelines for the Delisting and Recovery of the Puget Sound Chinook Salmon Evolutionarily Significant Unit. April 2002 Memo from Puget Sound Technical Recovery Team.
- Spence, B.C., G.A. Lomnický, R.M. Hughes, and R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. (Available at <http://www.nwr.noaa.gov/1habcon/habweb/habguide/ManTech/front.htm>)
- Washington Department of Fish and Wildlife (WDFW). 2003. "Fishdist: 1:24,000 (24K) and 1:100,000 (100K) Statewide Salmonid Fish Distribution". GIS data layer. (M. Hudson, data manager). Available from Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia WA 98501-1091.
- WDFW and PNPTT. 2000. Summer Chum Salmon Conservation Initiative; An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region. Report for WDFW and Point-No-Point Treaty Tribes

Table F1. Summary of Occupied Areas, PCEs, and Management Activities Affecting PCEs for the Hood Canal Summer-run Chum Salmon ESU

Map Code	Subbasin	Watershed	HUC5 Code	Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Presence/ Migration Only PCEs (mi)*	Management Activities**
F1	Skokomish	Skokomish River	1711001701	6.1	0	5.8	C, D, F, U
F2	Hood Canal	Lower West Hood Canal Frontal	1711001802	1.4	0	1.3	C, F, R, U
F2	Hood Canal	Hamma Hamma River	1711001803	2.7	0	<0.1	C, F, U
F2	Hood Canal	Duckabush River	1711001804	2.3	0	0	C, F, U
F2	Hood Canal	Dosewallips River	1711001805	3.3	<0.1	0	C, F, R, U
F2	Hood Canal	Big Quilcene River	1711001806	2.4	0.4	<0.1	C, F, U
F2	Hood Canal	Upper West Hood Canal Frontal	1711001807	1.4	0.2	<0.1	C, F, U
F2	Hood Canal	West Kitsap	1711001808	8.2	<0.1	5.9	A, F, U
F3	Kitsap	Port Ludlow/Chimacum Creek	1711001908	1.1	0	0	A, B, F, U
F4	Dungeness/Elwha	Discovery Bay	1711002001	3.7	0	0.4	A, C, F
F4	Dungeness/Elwha	Sequim Bay	1711002002	0.8	<0.1	0	C, F, U
F4	Dungeness/Elwha	Dungeness River	1711002003	3.2	0	10.8	C, F, R, S, U

* Some streams classified as “Presence/Migration Only PCEs” may also include rearing or spawning PCEs, but the GIS data are still undergoing review to confirm species use type.

** This list is not exhaustive. It is intended to highlight key management activities affecting PCEs in each watershed. Activities identified are based on the general categories described by Spence et al. (1996) and summarized previously in the “Special Management Considerations or Protection” section of this report. Coding is as follows: F= forestry, G = grazing, A = agriculture, C = channel modifications/diking, R = road building/maintenance, U = urbanization, S = sand and gravel mining, M = mineral mining, D = hydroelectric dams, I = irrigation impoundments and withdrawals, T = river, estuary, and ocean traffic, W = wetland loss/removal, B = beaver removal, X = exotic/invasive species introductions, H = forage fish/species harvest. Primary sources for this information were the CHART and reports by Ames (2000), Haring (2000), Correa (2003), and Kuttel (2003).

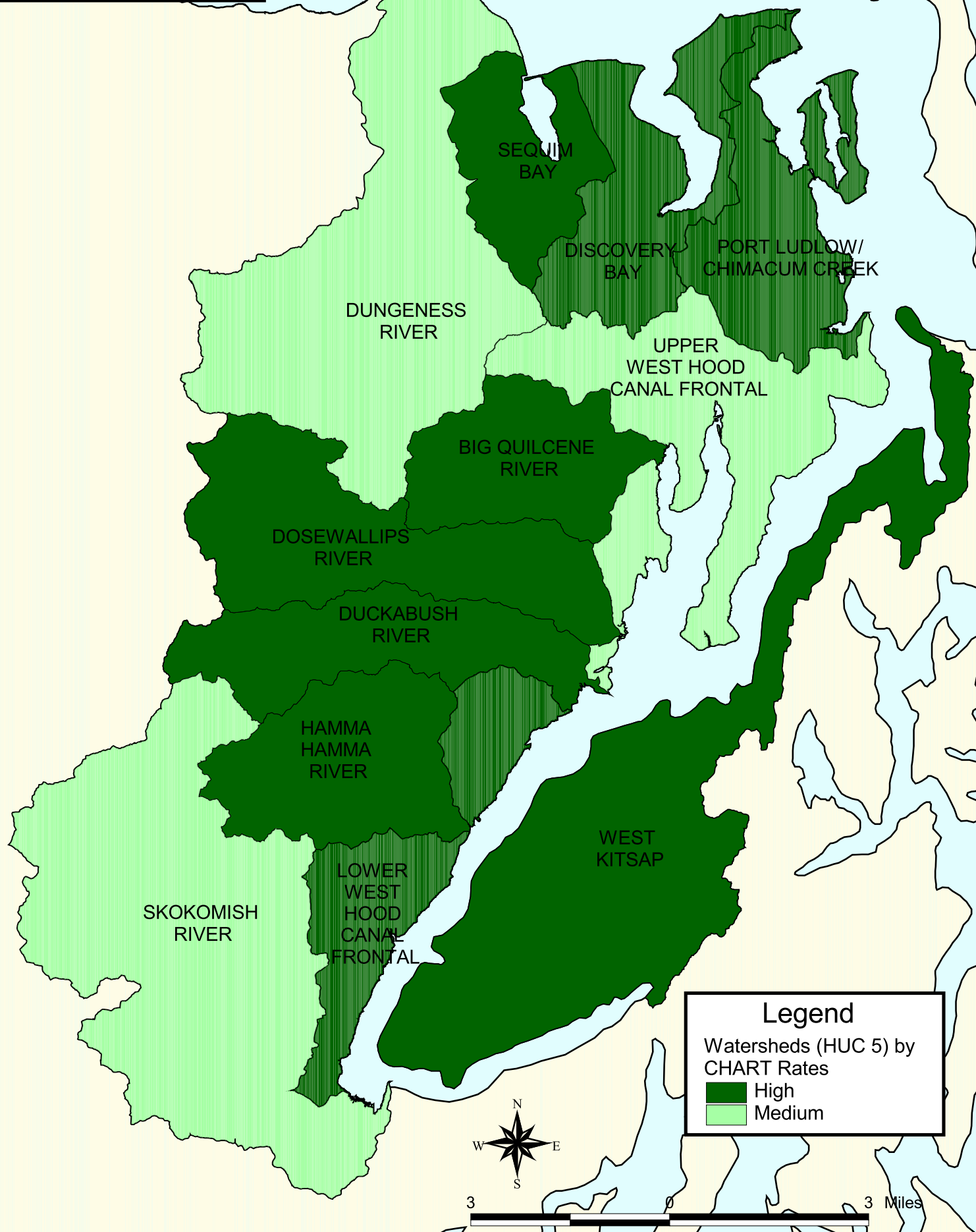
Table F2. Summary of Initial CHART Scores and Ratings of Conservation Value for Habitat Areas in HUC5 Watersheds Occupied by the Hood Canal Summer-run Chum Salmon ESU

Map Code	Subbasin	Watershed	HUC5 Code	Total HUC5 Score (0-18)	Comments/Other Considerations	Initial CHART Rating of HUC5 Conservation Value
F1	Skokomish	Skokomish River	1711001701	10	High HUC5 score but PCEs severely degraded, probably poorest of all HUC5s	Medium
F2	Hood Canal	Lower West Hood Canal Frontal	1711001802	12	High HUC5 score; genetic data indicate that Lilliwaup fish contain very unique alleles	High
F2	Hood Canal	Hamma Hamma River	1711001803	12	High HUC5 score; area recommended for supplementation; high potential production	High
F2	Hood Canal	Duckabush River	1711001804	10	High HUC5 score; population considered at low risk of extinction with high potential production; PCEs in FEMAT key watershed	High
F2	Hood Canal	Dosewallips River	1711001805	12	High HUC5 score; population considered at low risk of extinction with high potential production; PCEs in FEMAT key watershed	High
F2	Hood Canal	Big Quilcene River	1711001806	12	High HUC5 score; ongoing supplementation efforts	High
F2	Hood Canal	Upper West Hood Canal Frontal	1711001807	9	Moderate HUC5 score; limited distribution and small population size relative to other HUC5s in Hood Canal	Medium
F2	Hood Canal	West Kitsap	1711001808	13	High HUC5 score; approximately 1/3 of ESU distribution is in this HUC5; may be healthiest of runs in ESU	High
F3	Kitsap	Port Ludlow/Chimacum Creek	1711001908	8	Moderate HUC5 score but ongoing reintroduction efforts underscore area's importance	High

Map Code	Subbasin	Watershed	HUC5 Code	Total HUC5 Score (0-18)	Comments/Other Considerations	Initial CHART Rating of HUC5 Conservation Value
F4	Dungeness/Elwha	Discovery Bay	1711002001	12	High HUC5 score; one of only four occupied HUC5s supporting Strait of Juan de Fuca populations	High
F4	Dungeness/Elwha	Sequim Bay	1711002002	11	High HUC5 score; one of only four occupied HUC5s supporting Strait of Juan de Fuca populations	High
F4	Dungeness/Elwha	Dungeness River	1711002003	8	Relatively low HUC5 score for the Strait of Juan de Fuca region; uncertain whether area will be emphasized for recovery activities	Medium

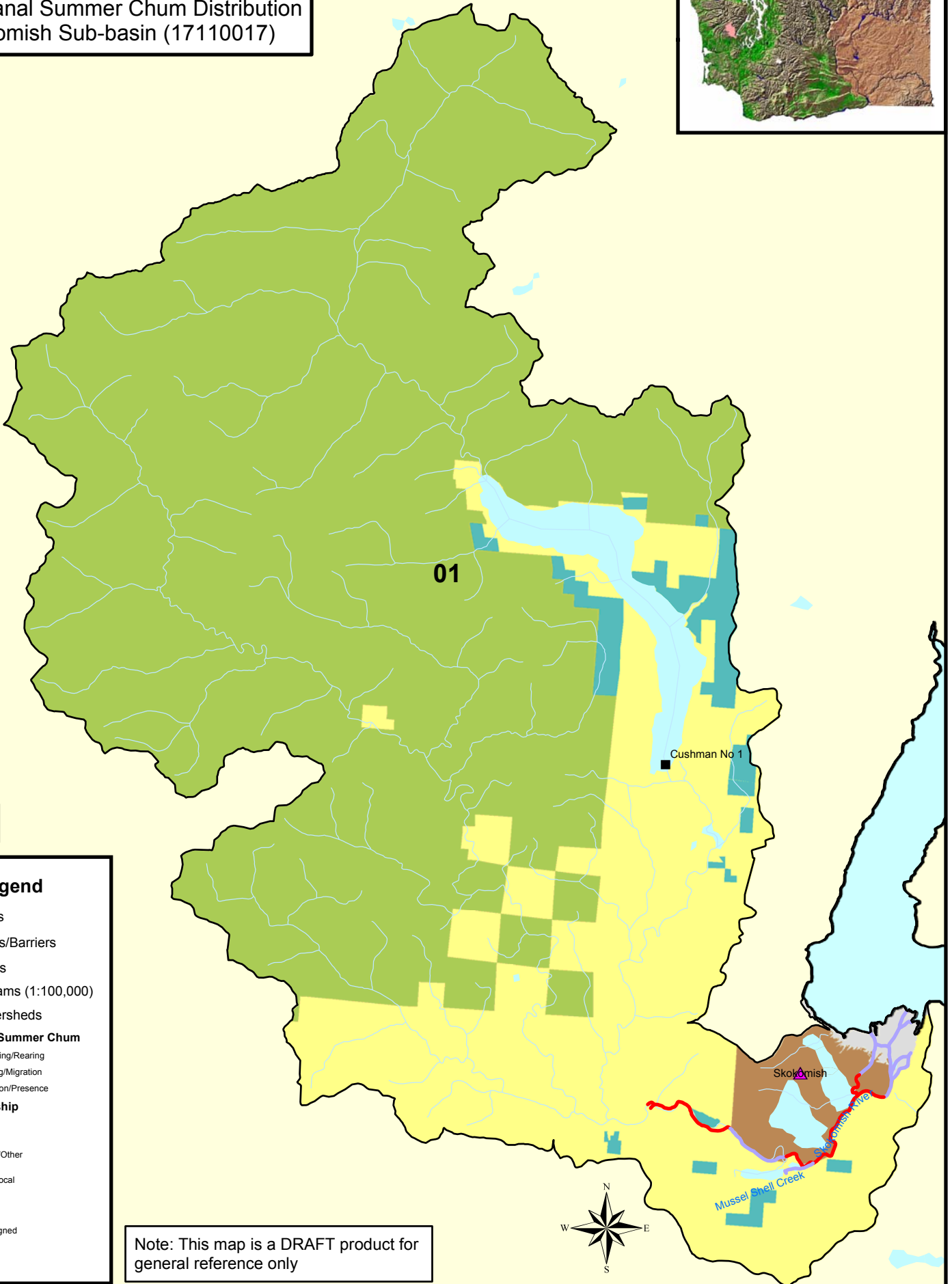
Figure F1. Initial CHART Ratings of Conservation Value for Habitat Areas in HUC5 Watersheds Occupied by the Hood Canal Summer-run Chum Salmon ESU

DRAFT
Hood Canal Summer Chum
CHART Watershed Ratings



Maps F1 through F5. Hood Canal Summer-run Chum Salmon ESU – Habitat Areas
Under Consideration for Critical Habitat Designation

DRAFT
Hood Canal Summer Chum Distribution
Skokomish Sub-basin (17110017)



Map F1

Legend

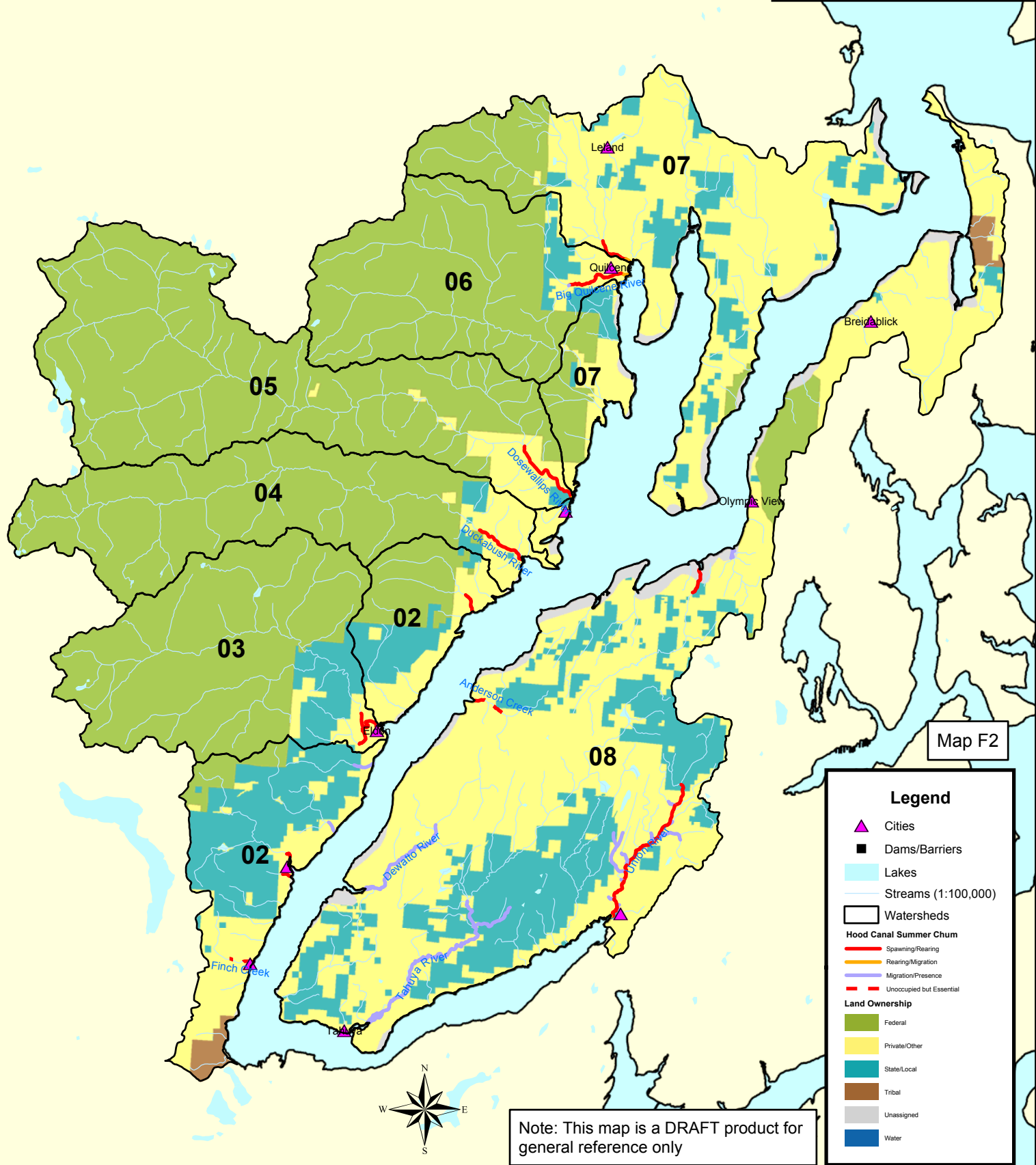
- ▲ Cities
- Dams/Barriers
- Lakes
- Streams (1:100,000)
- Watersheds
- Hood Canal Summer Chum**
 - Spawning/Rearing
 - Rearing/Migration
 - Migration/Presence
- Land Ownership**
 - Federal
 - Private/Other
 - State/Local
 - Tribal
 - Unassigned
 - Water

Note: This map is a DRAFT product for general reference only

Watershed code = last two digits of sub-basin code

0 1.25 2.5 5 7.5 10 Miles

DRAFT
Hood Canal Summer Chum Distribution
Hood Canal Sub-Basin (17110018)



Map F2

Legend

- ▲ Cities
- Dams/Barriers
- Lakes
- Streams (1:100,000)
- Watersheds

Hood Canal Summer Chum

- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Unoccupied but Essential

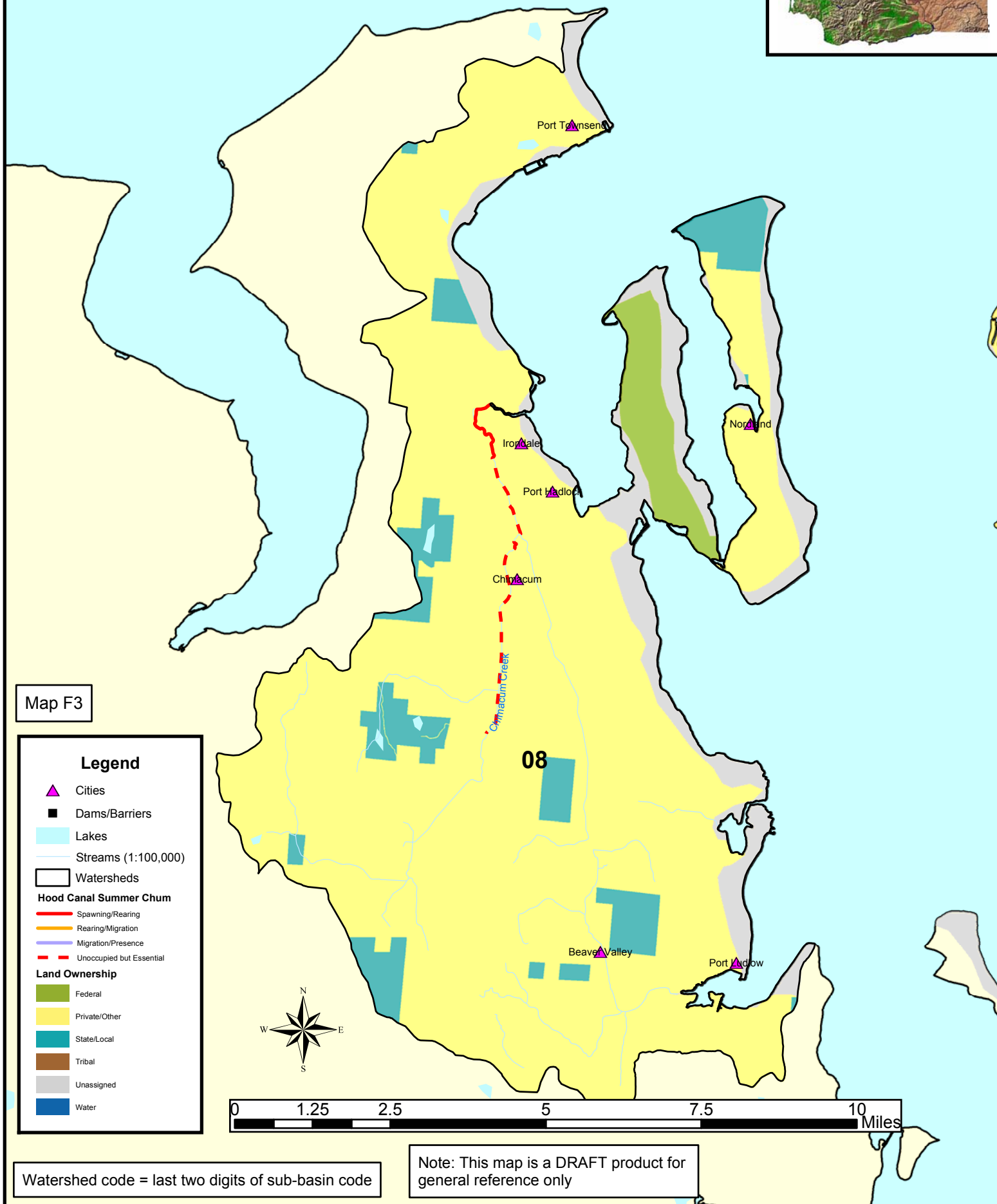
Land Ownership

- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Note: This map is a DRAFT product for general reference only

Watershed code = last two digits of sub-basin code

DRAFT
Hood Canal Summer Chum Distribution
Kitsap Sub-basin (17110019)



Map F3

Legend

- ▲ Cities
- Dams/Barriers
- Lakes
- Streams (1:100,000)
- Watersheds

Hood Canal Summer Chum

- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- - - Unoccupied but Essential

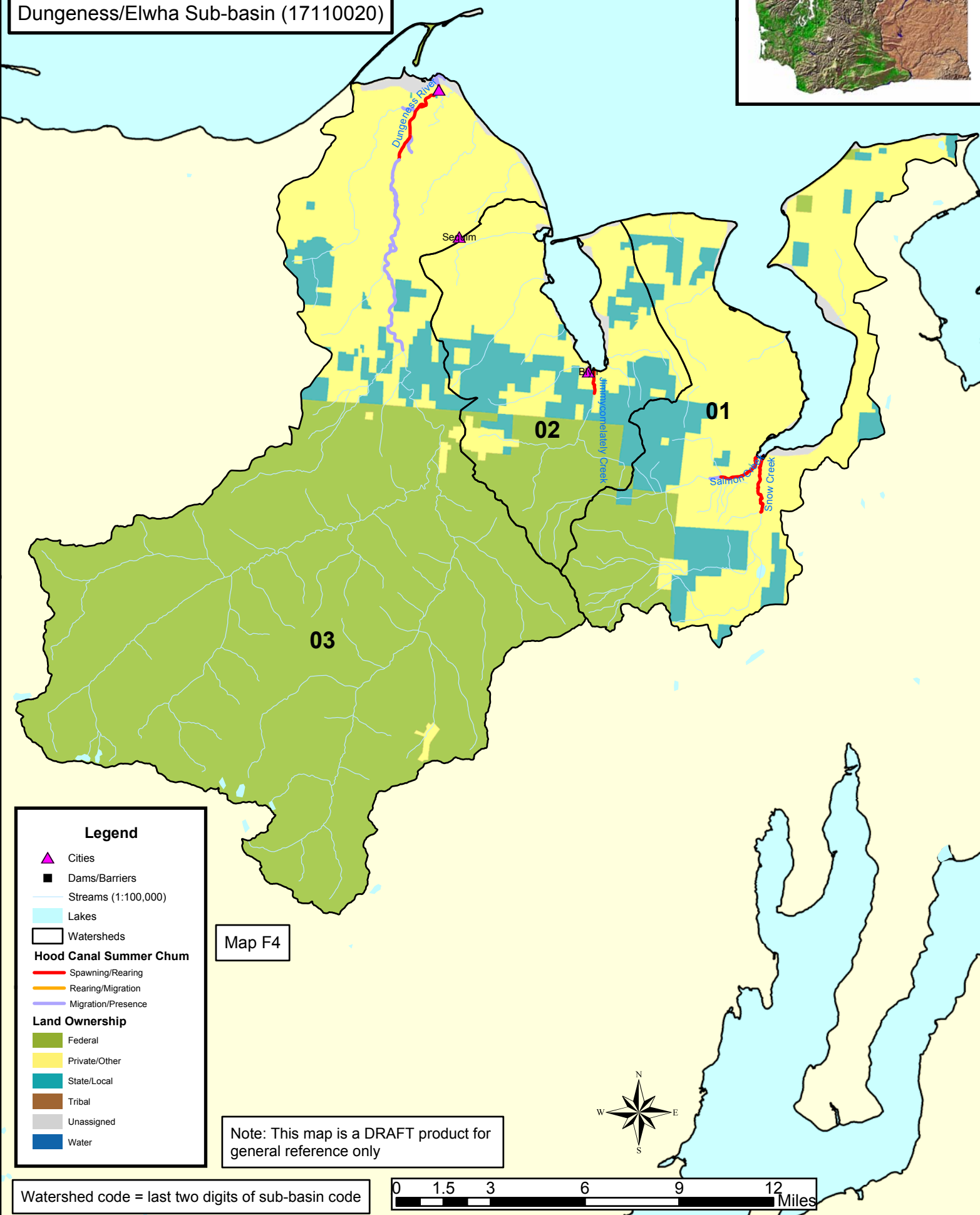
Land Ownership

- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Watershed code = last two digits of sub-basin code

Note: This map is a DRAFT product for general reference only

DRAFT
Hood Canal Summer Chum Distribution
Dungeness/Elwha Sub-basin (17110020)



Legend

- Cities
- Dams/Barriers
- Streams (1:100,000)
- Lakes
- Watersheds

Hood Canal Summer Chum

- Spawning/Rearing
- Rearing/Migration
- Migration/Presence

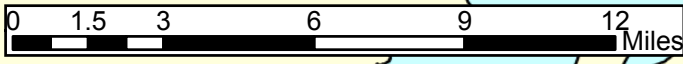
Land Ownership

- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Map F4

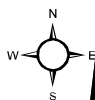
Note: This map is a DRAFT product for general reference only

Watershed code = last two digits of sub-basin code



Hood Canal Summer-run Chum Nearshore Zones

Map F5



0 1.5 3 6 9 12 Miles

